Using tech to peer inside a tyrannosaur’s skull

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By Sven Vogel

Paleontologists studying the skull of a 74-million-year-old tyrannosaur fossil colloquially? called the Bisti Beast from northwest New Mexico faced a dilemma. How could they peer inside the skull to determine the size of this bone-crusher’s brain and the layout of other features—details that would flesh out the dinosaur’s place in the evolutionary line culminating in the fearsome Tyrannosaurus rex—without damaging this rare, stunning, and toothy treasure?

A solution appeared from 90 miles up the road at Los Alamos National Laboratory. The Lab’s microtron accelerator creates very high energy x-rays whose penetrating power far exceeds what you’d find at your dentist’s office. Beyond that, the Los Alamos Neutron Science Center (LANSCE)—one of the country’s most powerful particle accelerators—creates a beam of high-energy neutrons, particles from an atom’s nucleus. Most people are familiar with the medical applications of x-ray images, but neutron scans are more exotic. Neutrons lack an electric charge and don’t interact with the electrons of an atom the way X-rays do. Instead, neutrons are scattered by the atom’s nuclei, which makes them more penetrating and gives different information about the sample being scanned.

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